SYSTEM AND METHOD FOR DISPLAYING DATA ON A PORTABLE DEVICE

BACKGROUND OF THE INVENTION

5   **1.   Technical Field:**

The present invention generally relates to an improved method of displaying data on a handheld device and in particular to an improved method of displaying data on a
10   handheld device having a display that is significantly larger in one dimension than the other.

2.   Description of the Related Art:

As portable electronics evolve, they are becoming as
15   small as possible to make them as convenient to carry as possible. Unfortunately, this means that the displays on these devices are also very small. As it becomes more common for portable devices such as Personal Digital Assistants (PDAs) and mobile telephones to communicate over
20   the internet, the limitations of these small displays become increasingly apparent.

For example, the World Wide Web (Web or WWW) browser on
25   portable telephones phones is becoming increasingly common. Unfortunately, the ideal dimension of a cell phone is constrained by the typical ear to mouth distance of a user, and the user's ease of gripping the telephone by hand. As a result, the display on the portable telephone must be
30   adapted to the long, narrow form of the telephone itself.

Essentially, even if the telephone provides a touch-

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screen keypad on the display itself, the maximum dimensions of the display screen on the telephone is about 2"x6", or 12 square inches. In terms of screen area, this is actually larger in area than typical PDA displays, which have

5   generally about a 3"x3" screen size that measure up to 9 square inches.

While a significant amount of data can be displayed on a 12 sq. in. display, the long, narrow dimensions of this

10   type of display make it very difficult to display data in a way that it is easily read by the user. Most Web based data will be designed for a screen much larger, in both directions, than the telephone display, and in truncated form, this data is difficult to read from the small display.

15   In particular, although the user may be able to easily read text that scrolls across the wide dimension of the telephone, the user will have much more trouble viewing data that scrolls across the narrow dimension. It would be desirable to provide a means to allow the user to read the

20   display in either direction, according to the data being displayed.

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SUMMARY OF THE INVENTION

It is therefore one object of the present invention to provide an improved method of displaying data on a handheld device.

It is another object of the present invention to provide an improved method of displaying data on a handheld device having a display that is significantly larger in one dimension than the other.

The foregoing objects are achieved as is now described. The preferred embodiment provides a system, method, and program product which enables the display on a portable device to "flip" itself between different screen orientations such that both the narrow dimension and wide dimension of the display can be exploited. The preferred embodiment is particularly adapted to displaying Web data on wireless devices such as a portable telephone, wherein the Web data can be effectively displayed by flipping the display orientation between the narrow and wide dimensions of the display. The flipping between screen orientations can be selected by user action or done dynamically by the portable device itself.

The above as well as additional objectives, features, and advantages of the present invention will become apparent in the following detailed written description.

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BRIEF DESCRIPTION OF THE DRAWINGS

The novel features believed characteristic of the invention are set forth in the appended claims. The invention itself however, as well as a preferred mode of use, further objects and advantages thereof, will best be understood by reference to the following detailed description of an illustrative embodiment when read in conjunction with the accompanying drawings, wherein:

Figure 1 depicts a block diagram of a portable device in accordance with a preferred embodiment of the present invention;

Figures 2A and 2B are exemplary diagrams of the display of a portable telephone in accordance with a preferred embodiment of the present invention; and

Figure 3 is a flowchart of a process in accordance with the preferred embodiment of the present invention.

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DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference now to the figures, and in particular with reference to **Figure 1**, a block diagram of a portable

5   device in accordance with the preferred embodiment is shown. The portable device, which may be a portable telephone, a PDA, a pager, or other device with an integrated display, comprises a processor **105**, which can write to display **110**. The processor **105** can also read and write to memory **115**.

10   Communications means **120** enables the processor to communicate over a wireless network, which in the preferred embodiment is a wireless telephone network. It should be noted that the communications means **120** is not necessarily integral to the portable device, but instead may be cable

15   connected to the portable device. For example, the portable device may be a PDA, which is connected via a cable to a wireless telephone, wherein the telephone functions as the communications means **120**. Alternatively, the portable device may be a portable telephone with an integrated

20   wireless communications means **120**.

The preferred embodiment provides a system, method, and program product which enables the display on a portable device to "flip" itself between different screen

25   orientations such that both the narrow dimension and wide dimension of the display can be exploited. The preferred embodiment is particularly adapted to displaying Web data on wireless devices such as a portable telephone, wherein the Web data can be effectively displayed by flipping the

30   display orientation between the narrow and wide dimensions of the display. The flipping between screen orientations can be selected by user action or done dynamically by the

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portable device itself.

     Figures 2A and 2B are exemplary diagrams of the display of a portable telephone in accordance with a preferred

5   embodiment of the present invention. These two figures show the same telephone **205**, which has a display **210**. Display **210** is shown as extending across most of the face of the telephone **205**, with a microphone **215** located at one end of the display and a speaker **220** located at the opposite end of

10   the display.

     The difference between these figures is the data **225/230** shown on the displays **210** themselves. In **Figure 2A**, data **225** is shown oriented so that the text is read across

15   the narrow dimension of the display **210**, as is conventional with current telephones. Here, it is clear that reading the display is very difficult. In **Figure 2B**, however, the data **230** has been rotated 90 degrees so that it extends across the wide dimension of display **210**. In this case, the data

20   **230** is much easier to read.

     Of course, the data being displayed at any given time will determine whether it would preferably be displayed across the narrow dimension as is data **225**, or across the

25   wide dimension as is data **230**. Therefore, the preferred embodiment provides that the user can choose either display mode at any time, and can easily "flip" between the wide and narrow views. The actual software or firmware programming needed to display the data in these two modes is considered

30   well within the abilities of persons of ordinary skill in the art.

According to the preferred embodiment, the user is provided with a mechanism to choose the display mode. This mechanism can be implemented by an actual button on the telephone, or by a touch-sensitive selection "button" on the

5   display **210** itself. As the user repeatedly activates the mechanism, the display will flip back-and-forth between the two display modes.

Alternatively to or in combination with the preferred
10   embodiment, the internet browser software or display manager software of the portable device itself can automatically determine the best orientation of the display data, and can alternate between the display modes.

Figure 3 is a flowchart of a process in accordance with
15   the preferred embodiment of the present invention. Here, the user first requests a web page, or other data page, using the wireless device (**step 305**). Next, the device receives the requested web page, or a truncated wireless markup language (WML) version of the requested web page
20   (**step 310**).

The device then displays the page in the default orientation (**step 315**), which will be referred to as Display Model. The user can set the default orientation to either
25   the wide or narrow orientation. Alternatively, the device can automatically determine the best-fit orientation for the display. By examining the line-width of the text being received, the device will determine whether the wide or
30   narrow orientation will be used as the default orientation for that set of text.

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Next, if the device is set to automatically move between display modes (**step 320**), then it will wait for a preset delay period (**step 325**), and then redisplay the page with a 90 degree rotated orientation (**step 330**), which will

5   be referred to as Display Mode2.

Otherwise, the system will wait for a user input. When the user activates the display change mechanism (**step 335**), as described above, the device will redisplay the page in

10   Display Mode2 (**step 440**). The process then repeats (**step 305**).

Of course, at any point during this process the user can interact with the device to navigate web pages, edit text, make telephone calls, or perform other functions of the device. These are not included in the flowchart of

15   **Figure 3** as they are not essential to the function of the preferred embodiment.

It is important to note that while the present

20   invention has been described in the context of a fully functional data processing system and/or network, those skilled in the art will appreciate that the mechanism of the present invention is capable of being distributed in the form of a computer usable medium of instructions in a

25   variety of forms, and that the present invention applies equally regardless of the particular type of signal bearing medium used to actually carry out the distribution. Examples of computer usable mediums include: nonvolatile,

30   hard-coded type mediums such as read only memories (ROMs) or erasable, electrically programmable read only memories (EEPROMs), recordable type mediums such as floppy disks,

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hard disk drives and CD-ROMs, and transmission type mediums such as digital and analog communication links.

5   While the invention has been particularly shown and described with reference to a preferred embodiment, it will be understood by those skilled in the art that various changes in form and detail may be made therein without departing from the spirit and scope of the invention.